

**IEEE CINCINNATI
SECTION
NEWSLETTER
MARCH 2005**



MARCH MEETING

U.C.'s ECET HONORS PROGRAM OVERVIEW

DATE: Thursday, March 24, 2005

PLACE : Raffel's – 10160 Reading Road (see below for directions)

TIME : 5:30 p.m. to 7:00 p.m. - Social Time/Dinner
7:00 p.m. to 8:30 p.m. - Program

COST FOR DINNER: \$10.00 for Student Members
\$15.00 for Members
\$20.00 for Non-Members

MENU SELECTIONS: Chicken Cordon Bleu, Creole with Shrimp & Scallops, Beef Stroganoff, Parley Buttered Potatoes, Broccoli with Cheese, Tossed Salad, Dinner Rolls and Butter, Apple & Peach Cobblers, Coffee, Tea Iced Tea, Soft Drinks. There is also a bar available for the purchase of alcoholic drinks. Raffel's is located at 10160 Reading Road, south of Glendale-Milford Road on the east side of Reading. Take I-75 to the Glendale-Milford Rd. Exit, go east on Glendale-Milford Road approximately 3/4 of a mile to Reading Rd. and turn right on Reading.

Please call the Cincinnati Section Voice Mailbox at **513-629-9380**, by **Noon, Tuesday, Mar. 22, 2005** if you plan to attend. Please leave your Name, IEEE Member Number, and a daytime telephone number. You can also make a reservation by e-mailing our Arrangements Chair, Charlie Nash, at cnash@ieee.org.

ABOUT THE PRESENTATION: This month's meeting of the IEEE Cincinnati Section presents an overview of the Honors Program in Electrical and Computer Engineering Technology (ECET) at the University of Cincinnati. The presentation will focus on the requirements of the Honors Program at the University of Cincinnati and how these requirements are tailored to meet the needs of engineering technology students. Methods for identifying good candidates for the Honors program together with methods of convincing promising students of the benefits of the program will be discussed. Three ECET department Honors projects were accepted for publication and will be presented at the annual 2005 American Association of Engineering Educators (ASEE) conference in Portland, Oregon, in June. This month's program is a preview of these papers. The presenters are Kathleen Ossman, James Everly, Brian Resnick, and Max Rabiee, all faculty of the ECET Department at the University of Cincinnati.

CHAIR'S MESSAGE

by Jim Everly, Section Chair

The month's meeting presents an overview of the Honors Program in Electrical and Computer Engineering Technology (ECET) at the University of Cincinnati. The presentation will focus on the requirements of the Honors Program at the University of Cincinnati and how these requirements are tailored to meet the needs of engineering technology students. Three ECET department Honors projects were accepted for publication and will be presented at the annual 2005 American Association of Engineering Educators (ASEE) conference in Portland, Oregon, in June. This month's program is a preview of these papers and provides an opportunity for ECET department faculty to get their ASEE PowerPoint presentations started Early.

The section Executive Committee meets this month for the final review the section budget and to "firm-up" technical meetings and activities for 2005. A list of activities together with planned meetings will be presented in next month's newsletter.

We are still looking for a person to fill a vacancy on the Cincinnati Section Executive Committee. The committee is searching for a Professional Activities Chairperson (PACE). The Executive committee meets four times a year and is responsible for section activities. If you have an interest in this position please contact me via email or telephone.

NEW MEMBERS

The following individuals are IEEE members who are new to our Section:

Steven C. Allen
Masoud Ghaffari
Jeffrey D. Herdtner
Nicholas R. Herpy
Adam R. Schwartz

We wish to welcome these new members to our Section!!!

University of Cincinnati - College of Applied Science Department of Electrical and Computer Engineering Technology (ECET) Looking for an Assistant Professor

The ECET department invites applications for a tenure track Assistant Professor of Computer Engineering Technology to begin teaching in Fall 2005. The department offers the Associate and Bachelor degrees in Electrical Engineering Technology (EET) and the Bachelor degree in Computer Engineering Technology (CET). Responsibilities include developing and teaching lecture and laboratory courses in both day and evening programs mainly in computer related areas, advising students, participation in scholarly activities, and service to the profession and university. Minimum requirements include a master's degree in electrical or computer engineering or engineering technology, teaching experience and demonstrable communications skills, along with three years relevant full time industrial experience. PhD and professional registration are plusses. The position will be available Fall, 2005 and will remain open until filled. Candidates from industry or engineering and engineering technology programs are encouraged to apply. Applicants that are not United States citizens must possess appropriate visa status. Applicants should send a letter of application, resume/vita, to include the name, address, telephone number and email address of four references to Professor Elvin Stepp (Elvin.Stepp@UC.Edu), University of Cincinnati. College of Applied Science, 2220 Victory Pkwy, Cincinnati, OH, 45206-2839.

A History of Electrical Engineering

Submitted by Dick Reiman, Historian

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Underrated Entrepreneur

Thomas Edison's overlooked business story

by Blaine McCormick and Paul Israel

Thomas Edison is remembered more as an inventive genius than as a businessman. Some may know he was granted more patents by the U.S. Patent and Trademark Office than any other person, 1,093 patents to be exact. Fewer know that he also started over 100 businesses and partnerships, some of which survive to this day. Edison is known around the world for inventing a practical and commercially successful incandescent electric light bulb. However, Edison also invented (or helped invent) entire industries, including the electric, music, motion picture, and battery industries. We will look at how Edison succeeded as an inventor primarily because he was better than his competitors at marshaling the forces and institutions of business.

Myth Versus the Real Thomas Edison

Myths about Edison abound, with one of the most popular being that he was a terrible businessman more likely to hit a "lucky streak" than to intentionally manage the innovation process. Compounding this misconception, the 1940 film *Edison, the Man*, starring Spencer Tracy, portrayed Edison as uninterested in and confused by the financial side of invention. Nothing could be further from the truth. Edison (see Figure 1) was keenly aware of the economic considerations of his inventions and could even be critical of his contemporaries for ignoring business realities.



Figure 1. Thomas Edison in 1881 at 34 years of age.
(Photo courtesy of the Edison National Historic Site.)

Edison's business story began before he was a teenager and extended almost until the day of his death. By the age of 12, he had begun selling newspapers and candy on the Grand Trunk Railroad that connected Detroit to his hometown of Port Huron, Michigan. Apparently discontented with selling other people's newspapers, he began printing his own publication, *The Weekly Herald*, and selling it on the train as well. At the same time, he managed a vegetable stand and transported some of the produce to Detroit for resale where it brought a higher price. Edison exhibited such entrepreneurial ability throughout his life, and it proved crucial to his many achievements. We will sift through Edison's life and highlight a few of the factors that contributed to his business success. Put simply, Edison succeeded more than other inventors of his day primarily because he was a better businessman.

Invention Is a Commercial Process

Edison had little desire to become a "business tycoon" and spend all his time overseeing a sprawling industrial empire. He preferred to remain in the laboratory, and his true business was the innovation of new products, at which he was highly successful. Although he was often involved in key management decisions of the companies established to capitalize on his inventions, Edison saw his role primarily as that of inventor. Furthermore, the roots of his inventive practices can be traced to the time he spent in the emerging telegraph industry.

Edison began studying telegraphy in the autumn of 1862, when he was 15 years old. Within a few years, he had begun working for the Western Union Company and inventing improved telegraph equipment. In 1868, he settled in Boston and began creating a name for himself within the telegraph industry. Edison filed his first telegraph patent in 1869 and by 1871 was referred to as "the best electro-mechanician in the country" by Western Union President William Orton. Over the course of his life, Edison would file only slightly fewer telegraph patents (186 patents) than he filed in the field of recorded sound (199 patents). This is ironic given that few people acknowledge Edison as a major force in the early telegraph industry. In part, this perception arises from Edison's role as a contract inventor who relied on others to introduce his inventions.

Edison's life revolved almost solely around the telegraph industry from his introduction to telegraphy in 1862 until he conceived the idea for the electric pen in June 1875. His work in the telegraph industry contributed greatly to his entrepreneurial success in other industries later in his life. Furthermore, Edison's experience in the telegraph industry gave him a deep well of business experience from which he could draw and which other inventors of his day lacked.

An important moment in Edison's life accompanied the receipt of his first patent in 1869. The patent was for an electric vote recorder that allowed members of legislative bodies to tally votes using electricity rather than through the slow process of roll call. Edison hoped to get some money for the invention but was firmly rejected on his first sales call to the Massachusetts state legislature. He tried next to sell the invention to the federal government in Washington, DC, but was told, "Young man, that is just what we do not want." The business-minded Edison had overestimated the importance of speed in the slow world of legislative filibustering. On his way home, Edison resolved never to invent anything that did not have what he called "commercial demand."

For the most part, this proved to be a highly successful strategy ensuring that Edison's goal was not just invention but innovation. During the research and development work on a new technology, he paid close attention to ways to lower operating and manufacturing costs and methods of adapting the technology to the needs of users. And once he began commercial introduction of a new technology, Edison devoted a great deal of attention to improving the manufacturing processes to reduce the cost of the new technology. Also, he continued research and development so that he could better adapt his products to the needs of users. Figure 2 shows Edison's first lamp factory, where he manufactured his incandescent lighting system.

Attention to these market-driven issues enabled Edison to successfully innovate new technologies and establish highly successful companies in the phonograph, motion picture, cement, and storage battery industries. His only notable failure was an effort to refine low-grade iron ore, on which he spent millions of dollars of his own money. Yet, Edison could absorb the cost of this failure because he was highly successful in other endeavors. And in each instance, Edison relied on highly competent managers to oversee these businesses.

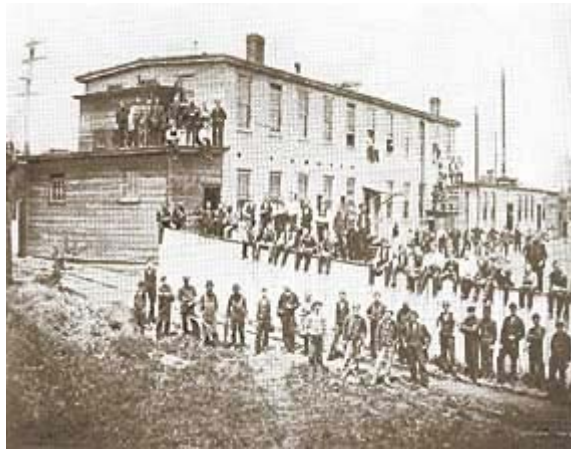


Figure 2. Edison established his first lamp factory near his laboratory in Menlo Park, New Jersey, so that he could refine the manufacturing process and improve the lamps as he moved to commercial introduction of his lighting system. (Photo courtesy of the Edison National Historic Site.)

Superior Understanding of the Patent and Legal System

Edison filed his first patent application in 1868 at the age of 21. Furthermore, he filed well over 100 patents prior to achieving international fame with the invention of the phonograph in 1878. These ten years of patent activity in the telegraph industry taught Edison how to navigate the patent and legal system in America. By the time he invented the phonograph and the practical incandescent electric light bulb, Edison was better prepared than his competitors to capture the gains associated with his new inventions.

Figure 3 shows Edison's U.S. patents by execution date. Readers will note that although he invented the practical electric light bulb in 1879, there's a spike in patent activity in the four years that follow. Other spikes occur during his telegraphy years in the early 1870s and again in the late 1880s and early 1890s. Rather than remaining flat, Edison's patent activity experienced peaks and valleys depending on his efforts to improve the commercial viability of an invention. One of his basic strategies is captured in this statement about some of his electrical patents. Edison noted, "The patents I am now taking are more valuable than those already taken. Those already taken were to secure if possible the science of the thing. Those I am now taking are commercial."

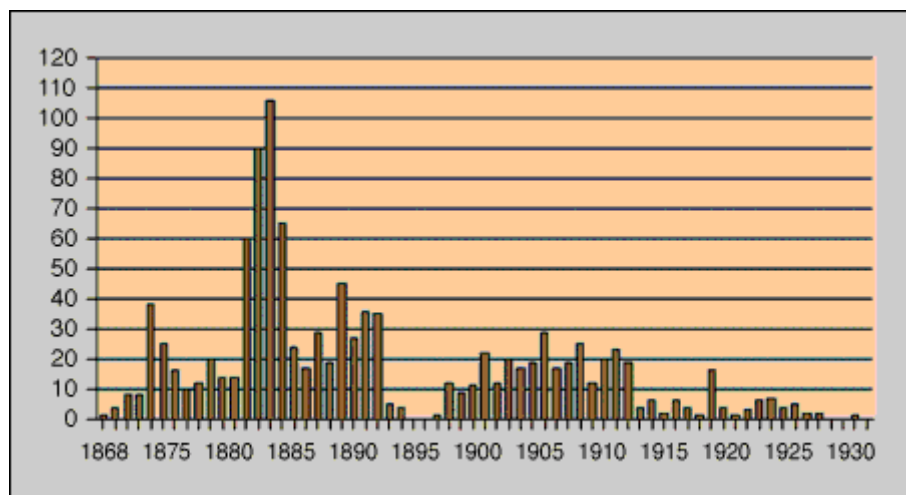


Figure 3. Edison's U.S. patents by execution date.

Edison learned very early during his work in the telegraph industry that there's more than one way to solve a problem. Working as a contract inventor for competing companies, Edison found it necessary to take some care in juggling both his own interests and the interests of those paying for his inventive work. Yet, working on

multiple projects also stimulated him. This became a hallmark of his inventive style, as ideas and devices from one experiment or design influenced another. In Edison's words, if he reached a dead end on one project, he would "just put it aside and go at something else; and the first thing I know the very idea I wanted will come to me. Then I drop the other and go back to it and work it out."

In fact, Edison frequently used experiments in one direction to suggest ideas for other lines of research and often drew on elements of one technology to improve another. Sometimes, he did no more than note ideas that emerged from such explorations in his notebooks or patent caveats, but at other times they became the basis for a new research project. A related characteristic was Edison's tendency to conceive seemingly endless variations in the design for a particular device. His early notebooks often contain the statement "I do not wish to confine myself to any particular device." These words represented not only a legalistic phrase associated with the patent system but also corresponded to Edison's pattern of sketching numerous alternative solutions to a particular problem.

Edison's sophisticated understanding of the patent system grew out of his experience as a contract inventor in the telegraph industry. As an inventor for the Gold and Stock Telegraph Company, Edison learned from its president, Marshall Lefferts, that by acquiring all of the key patents on printing telegraph technology, the company was able to control the field of market reporting. Soon after Edison told William Orton, president of Western Union, that he could readily invent around the patented system of duplex telegraphy (for sending two messages simultaneously over a single wire) that the company had recently put on its lines. Boasting that "the business of making a duplex [w]as a very trifling affair," Edison showed Orton a variety of alternative designs. Edison was hired to invent duplexes "as an insurance against other parties using them." Edison's work on duplexes led to his most important telegraph invention, the quadruplex telegraph, which enabled four messages to be sent simultaneously over one wire.

Superior Exploitation of Capital Markets

It was previously mentioned that Edison had much greater resources for research and development than any other inventor of his time. He had established his name as a telegraph inventor, and this earned him access to financial support from Western Union financiers such as J.P. Morgan and William Vanderbilt and company officials such as Norvin Green. Green was also the first president of the Edison Electric Light Company, which was established to support Edison's work. Among those who established the company were directors of Western Union and partners in Morgan's firm. These men were willing to back Edison's venture in electric lighting because of his previous work for Western Union and due to his enhanced reputation as an inventive "wizard" following his invention of the phonograph. Edison's reputation was a product of both his creative technical feats and his facility for self-promotion.

One good example of Edison's talent for exploiting capital markets occurred during the invention of the practical electric light. Contrary to popular perception, Edison was not the first person to have a working electric light bulb. In fact, historians have documented the fact that more than 20 people preceded Edison with a working electric light bulb, some being his contemporaries. Edison began experimenting with electric light in August 1878, long after competitors like Joseph Swan, Moses Farmer, and William Sawyer (to name a few) began their work.

So what enabled Edison to start later, yet leapfrog his competitors to become known as the inventor of the electric light bulb? One explanation is that Edison was better positioned to exploit the capital markets at the time. First, Edison had a solid understanding of the entire system of electricity that was necessary to support an electric light bulb. His work in the telegraph industry greatly contributed to his understanding of various electrical apparatus and electrical systems. Second, Edison was fresh from the invention of the phonograph the previous year, a time at which the New York Daily Graphic dubbed him the "*Wizard of Menlo Park*," as shown

in Figure 4. He had toured the country, met President Rutherford B. Hayes, and received overwhelming amounts of press for his admittedly unprecedented invention.



Figure 4. Following the introduction of the phonograph, Edison was dubbed the "Wizard of Menlo Park" in July 1878 by New York Daily Graphic reporter William Croffut.

Finally, Edison possessed better facilities than anybody else and was supported by a team of workers ready to tackle the invention of the practical electric light bulb and the development of a comprehensive electric power system. No other inventor had anything approaching the scope of Edison's well-equipped Menlo Park lab, shown in Figure 5, and no other business leader in the country had a more experienced team of inventors. These three things, knowledge, reputation, and facilities, allowed Edison to corner the existing capital market for research and development funds for the electric light bulb. Records indicate that Edison received about US\$130,000 of venture capital in the two and a half years of active research and development between September 1878 and March 1881. None of his competitors received anything remotely close to this amount. Using these funds, Edison purchased new equipment for his laboratory, built a new and larger experimental machine shop, and added a combined office and library building that he stocked with books and journals that had previously been beyond his means to purchase. Given that many of his competitors were self-financed, relatively unknown in comparison, and poorly equipped, it's no wonder that Edison outmaneuvered them.



Figure 5. With funds from the Edison Electric Light Company, Edison expanded the original Menlo Park laboratory (center) by adding a larger machine shop (rear) and a library-office. This painting also depicts the experimental electric railroad (right) that he was working on as part of his plan to sell power as well as light. (Photo courtesy of the Edison National Historic Site.)

Conclusion

A recent poll of business historians published in *Business History Review* ranked Edison fifth in a list of the ten greatest entrepreneurs and business people in American history. In this poll, Edison's name appeared with giants of enterprise such as Henry Ford, Bill Gates, Sam Walton, and Alfred Sloan. A broad range of historians clearly consider Edison's business story to have merit, as he not only placed in the top five but trailed only Henry Ford and John D. Rockefeller in the number of first place votes received.

Scholars and historians have most likely condemned Edison to business ignominy for the act of creating vast amounts of wealth and letting much of it slip through his fingers. Although there is some truth to this observation, it would be shortsighted to continue this trend as it focuses entirely on what Edison failed to do (i.e., capture wealth) and almost completely ignores his many business successes. Continuing to view Edison as the great American inventor who paid no attention to business conforms more to the conventions of Hollywood than the historical record. As columnist Allen Barra warned (with a nod to George Santayana), "Those who do not study history are forced to get it from Hollywood."

For Further Reading

- P. Israel, *Edison: A Life of Invention*. New York: Wiley, 1998.
 A. Millard, *Edison and the Business of Innovation*. Baltimore, MD: Johns Hopkins, 1990.
 B. McCormick, *At Work with Thomas Edison*. Irvine, CA: Entrepreneur, 2001
The Papers of Thomas A. Edison (vol. 1-5). Baltimore, MD: Johns Hopkins [Online]. Available:
<http://edison.rutgers.edu>

College of Applied Science

TECH EXPO 2005

TECH EXPO

Friday, May 20, 2005
10:00 a.m. – 7:00 p.m.

Cinergy Center

(Convention Center – downtown Cincinnati)

contact:

Betsy Zelek

513/702-2732

bzms@zoomtown.com

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- Be featured as a sponsor of our VIP networking reception and awards ceremony — *plus* invitations for your company representatives to attend this special event
- Sponsor a departmental award named for your business — award will honor a top student display at Tech Expo
- Receive a complimentary booth at the popular CAS Job Fair, held in 2005-06 — a \$250 value that provides access to hundreds of students and alumni!
- Assist in selection of the *Industry Partners Commendation Award* for the best senior project display
- 10' x 10' display booth during Tech Expo 2005
- Have a photo of your Expo booth *plus* a corporate listing in the 2005-06 edition of *Tech Record* (alumni publication — distribution 10,000)
- Corporate Listing in 2005 edition of the Tech Expo Program

RIEVESCHL

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- Sponsor a departmental award named for your business — award will honor a top student display at Tech Expo 2005
- Receive a complimentary booth at the popular CAS Job Fair, held in 2005-06 — a \$250 value that provides access to hundreds of students and alumni!
- Assist in selection of the *Industry Partners Commendation Award* for the best senior project display
- 10' x 10' display booth during Tech Expo 2005
- Invitation for your company representatives to attend the VIP networking reception at Expo 2005
- Have a photo of your Expo booth *plus* a corporate listing in 2005-06 edition of *Tech Record* (alumni publication — distribution 10,000)
- Corporate Listing in 2005 edition of the Tech Expo Program

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- 10' x 10' display booth during Tech Expo 2005
- Invitation for your company representatives to attend the VIP networking reception at Expo 2005
- Corporate Listing in 2005-06 edition of *Tech Record* (alumni publication — distribution 10,000)
- Corporate Listing in 2005 edition of the Tech Expo Program

Your sponsorship is tax deductible to the fullest extent of the law. Checks should be made payable to the University of Cincinnati Foundation.

IEEE NEWS

The current issue of IEEE's "The Institute" is now available for viewing at <http://www.ieee.org/theinstitute>. Included in this issue:

- Virtual Society Provides Real Benefits. For a society formed only a year ago, the IEEE Product Safety Engineering Society has quickly become popular. At the end of 2004, it had 474 members, a 138 percent jump from the 198 members with which it began the year. Find out what's behind the society's growth at <http://boldfish.ieee.org/u/society6d/04824637>
- More Articles Take to Online Preview. The number of IEEE transactions and journals that post articles online before they're available in print has soared over the last four years. Thirty-three publications now offer such article previews, up from just one in 2001. Read more at <http://boldfish.ieee.org/u/preview/04824637>
- Telecommunications Pioneers Tell Their Stories in New Book. "The Marconi Century," written by staffers from the IEEE History Center, chronicles the work of the innovators behind the telecommunications achievements of the last 100 years, from wireless telegraphy and radio to the Google search engine. The book also contains interviews with many of the pioneering scientists and engineers behind some of the more recent advances. Find out more at <http://boldfish.ieee.org/u/book/04824637>
- Scout's Honor: Engineering Is Cool. IEEE Member Ralph Russell is scouting around for the next generation of electrical engineers and he's finding them through his work with the Boy Scouts of America. For the past 20 years, he's led a partnership between the IEEE and the Boy Scouts to promote the technological literacy of young people. Find out more at <http://boldfish.ieee.org/u/russell6h/04824637>
- The Institute Seeks Members Involved in Post-Tsunami Rebuilding. If you or an IEEE colleague are helping to rebuild vital infrastructure in countries affected by the tsunami in Southeast Asia, or if you're developing systems to predict future tidal waves and provide early warning, The Institute wants to hear from you for an upcoming article. Write to k.kowalenko@ieee.org
- Marketplace of Ideas: A Place in Space. The Hubble Space Telescope's main batteries are likely to fail by 2009, putting the observatory out of action permanently. Should Hubble be serviced and saved or replaced and left for scrap? Why? Weigh in at institute@ieee.org
- IEEE Members Get Discount on Intel Developer Forum. Register by 27 February and receive a US \$320 discount on registration to the conference, to be held 1-3 March in San Francisco. Topics covered will include innovations in systems and communications technologies. Also, stop by and visit the IEEE Spectrum and IEEE Computer Society booths, which will be on the exhibition floor at the conference. To register for the conference, visit <http://boldfish.ieee.org/u/forum6j/04824637> and enter code: **SGTEMSGB**.
- Register Now for Student-Made Video Competition. Named after Leonardo da Vinci, VINNY is an award given to students from around the world in grades K-12 for the best one-minute videos explaining how science, technology, engineering, and mathematics can help solve such common problems as environmental pollution or food distribution. The IEEE Foundation is a cosponsor. Teachers must register a team of students by 15 February. The students will have to submit their video for judging by 1 April. For more information on the contest, visit <http://boldfish.ieee.org/u/video6k/04824637>

- Get Involved in National Engineers Week. Celebrate U.S. National Engineers Week, or EWEEK for short, by visiting an engineering site near you. Available on the EWEEK Web site, "A Sightseer's Guide to Engineering" lists by state dozens of museums, laboratories, and engineering marvels. EWEEK, held 20-26 February, is dedicated to raising public awareness of engineers' contributions to society, promoting the importance of technical literacy, and motivating youth to pursue engineering careers. Find out more about EWEEK at <http://boldfish.ieee.org/u/eweek6w/04824637>
- Partnership Aims to Reduce Injuries From Electric Arcs. The IEEE and the National Fire Protection Association have joined forces to reduce exposure to arc-flash hazards of those working near electrical equipment. An arc flash is that great, noisy spark of electric current that roars through the air when insulation between electrified conductors and the ground cannot withstand the voltage difference between them -- in effect, creating a short circuit through the air. Read more at <http://boldfish.ieee.org/u/arc6x/04824637>
- Learn How Medicare Affects U.S. Members' Insurance Coverage. Age 65 represents a major milestone for many members, not only because they plan to retire, but because they also become eligible for the U.S. government's Medicare hospital and medical insurance. You might not realize, however, that once you've enrolled in Medicare, other health care and insurance plans that you have work differently and may not pay benefits the same way. Find out more at <http://boldfish.ieee.org/u/medicare6y/04824637>
- IEEE's Travel Services Upgrades Web Site, Lowers Fees. Making travel arrangements through IEEE Travel Services has been simplified and made a little cheaper, thanks to improvements in the services' recently revamped Web site. A new online booking tool has been introduced, and fees have been lowered. Find out more at <http://boldfish.ieee.org/u/travel6z/04824637>
- Attracted to Japan: the International Magnetism Conference. Like to know what's new in magnetism and its related technologies? Then you may find yourself drawn to the International Magnetism (Intermag) Asia 2005 Conference to be held 4-8 April at the Nagoya Congress Center in Japan. Intermag is the premier conference in the field of applied magnetism, addressing basic and applied science and technology efforts being pursued around the globe. Read more at <http://boldfish.ieee.org/u/magnetism6-/04824637>
- New Proceedings Track Advances In Electronic Components. The latest advances in polymers for electronic packaging and in component finishes for lead-free electronics, as well as papers on microelectromechanical systems and nanotechnology, are now available in the proceedings of the 54th IEEE Electronic Components and Technology Conference. Topics covered include thermal management materials, nanoscale packaging, integrated passive technology, and lead-free solders. For additional information, or to purchase the proceedings, visit ShopIEEE at http://boldfish.ieee.org/u/proceed6_/04824637
- 2005 Education Award Nominations Due. The IEEE Educational Activities Board is accepting nominations for its awards until 30 April. These include the Meritorious Achievement Award in Accreditation Activities, IEEE EAB Meritorious Achievement Award in Continuing Education, IEEE EAB Major Educational Innovation Award, IEEE EAB Pre-College Educator Award, IEEE EAB Meritorious Service Citation, and the IEEE EAB Employer Professional Development Award. In addition, members can be nominated for the IEEE EAB Society/Council Professional Development Award, which will be given for the first time this year. For award descriptions, honorarium details, and nomination packets, visit <http://boldfish.ieee.org/u/awdnom6+/04824637>

- Members Receive Discount to the Embedded Systems Conference. IEEE members who register for the Embedded Systems Conference, to be held 6-10 March in San Francisco, will receive a 10 percent discount on the registration fee. The discount is available through 2 March. Visit <http://boldfish.ieee.org/u/discount70/04824637> and use code **UX20**.

Congressman Rohrabacher and Former IEEE-USA Board Member

Head 2004 IEEE-USA Award Recipients

WASHINGTON (9 February 2005) -- Rep. Dana Rohrabacher (R-Calif.), former chairman of the House Science Committee's Subcommittee on Space and Aeronautics; and Dr. Charles P. Rubenstein, a 2003 member of the IEEE-USA Board of Directors and Operating Committee, will receive IEEE-USA professional awards.

Rohrabacher and Rubenstein join fellow IEEE-USA award recipients in recognition of their professionalism and technical achievements, as well as literary contributions to public awareness and understanding of the engineering profession in the United States.

Rohrabacher is being honored with the IEEE-USA Distinguished Public Service Award "for long-term support of IEEE-USA's Congressional Fellowship program and leadership on federal policy issues of concern to the engineering community." Steve Watkins served as an IEEE-USA Congressional Fellow last year in Rohrabacher's office, and Randall Brouwer holds the position in 2005.

Rubenstein, who lives in Massapequa, N.Y., is receiving IEEE-USA's highest honor, the Robert S. Walleigh Distinguished Contributions to Engineering Professionalism Award. An IEEE senior member and active volunteer, Rubenstein works as a tenured professor of information science at New York's Pratt Institute graduate School of Information and Library Science. He is being recognized "for sustained leadership and inspiration in professional activities within the IEEE Divisions and Regions."

IEEE-USA's distinguished awards are administered under its Awards and Recognition Committee and approved by the IEEE-USA Board of Directors. They will be presented at a 12 March awards ceremony held in conjunction with the IEEE-USA Leadership Workshop in Tucson, Ariz.

<http://www.ieeeusa.org/calendar/conferences/2005workshop/default.asp>

Here's the complete list of 2004 award recipients:

Professional Awards

ROBERT S. WALLEIGH DISTINGUISHED CONTRIBUTIONS TO ENGINEERING PROFESSIONALISM AWARD

Charles P. Rubenstein: "For sustained leadership and inspiration in professional activities within the IEEE Divisions and Regions"

DISTINGUISHED PUBLIC SERVICE

Dana Rohrabacher: "For long-term support of IEEE-USA's Congressional Fellowship program and leadership on federal policy issues of concern to the engineering community"

PRECOLLEGE EDUCATION COMMITTEE TEACHER-ENGINEER PARTNERSHIP

Mark R. Rognstad & William G. Speed, Jr.: "For providing mentorship, support, and encouragement to students interested in science, technology, and mathematics through engineering competitions at the local, regional and national levels"

CITATION OF HONOR

Donald W. Hill: "For sustained leadership in PACE activities at the national level"

Philip Holmer: "For leadership in providing analysis and guidance regarding technology policy to Congress as Chair of IEEE-USA's Committee on Transportation and Aerospace Technology Policy"

Glenn S. Tenney: "For increasing the visibility of the IEEE-USA Intellectual Property Committee, and contributing to testimony presented to the Senate Judiciary Committee regarding the Inducing Infringement of Copyrights Act of 2004"

George W. Zobrist: "For enthusiastic service on behalf of the professional needs of U.S. members and students as Editor of IEEE Potentials Magazine and Member Activities Editor for IEEE-USA Today's Engineer and News & Views"

REGIONAL PROFESSIONAL LEADERSHIP AWARD

Parviz Famouri (Region 2): "For organizing and executing PACE training sessions for Sections in Region 2 having limited PACE activities"

Robert H. Gauger (Regional): "For efforts to improve professional standards, integrity and business practices of U.S. IEEE consulting engineers"

Tarek Lahdhiri (Region 4): "For providing professional training to Sections, Chapters and PACE leaders within Region 4"

William Marshall (Region 3): "For championing new programs within the Atlanta Section, in areas such as PACE, GOLD, K-12 Outreach, and Industry Relations"

Winnfort J. Myles (Region 6): "For effectively communicating professional ideas, and educating and training other leaders in Region 6"

Hamid Vakilzadian (Region 4): "For efforts in promoting PACE activities within the Nebraska Section and the West Area of Region 4"Hamid

PROFESSIONAL ACHIEVEMENT AWARD

Luke R. Maki: "For significantly improving the IEEE-USA Committee on Communications and Information Policy's effectiveness and image in the technology policy areas of broadband communication and improved spectrum use"

George F. McClure: "For pioneering the research and dissemination of information concerning the outsourcing of engineering jobs to other countries, and its effects on U.S. engineers"

C. Lee Stogner: "For reestablishing the IEEE-USA Government Activities Committee, and focusing its activities on member interaction with state legislatures and Congress"

Technical Awards

HARRY DIAMOND MEMORIAL AWARD

Robert K. Parker: "For leadership in radio frequency vacuum electronics, and pioneering technical contributions in the fields of intense relativistic electron beam technology, free electron lasers and gyro-amplifiers"

ELECTROTECHNOLOGY TRANSFER AWARD

David O. Patterson: "For spearheading development of advanced lithographic approaches and tools that foster exceptional advances in Department of Defense system capabilities and their transfer to commercial application"

Literary Awards

DISTINGUISHED LITERARY CONTRIBUTIONS FURTHERING PUBLIC UNDERSTANDING OF THE PROFESSION

William J. Mitchell: "For increasing public understanding of information technology in everyday life through his book, Me++: The Cyborg Self and the Networked City"

Terri Spitz, Steven Cooper and Scott Schroeder: "For increasing public understanding of the impacts on engineering employment due to the H-1B and L-1 visa programs through their TV news series, Stolen Jobs"

For more information, visit the IEEE-USA Awards and Recognition Web page at <http://www.ieeeusa.org/volunteers/committees/awards/>, or contact Sandra Kim at sandra.kim@ieee.org. Nominations are being accepted for the 2005 awards. The deadline is 31 July 2005.

IEEE-USA Supports Reverse Engineering in Brief Before Eighth Circuit Court of Appeals

WASHINGTON (9 February 2005) -- IEEE-USA filed an amicus curiae brief on 24 January in support of reverse engineering for interoperability in the U.S. Court of Appeals for the Eighth Circuit in the case of Blizzard Entertainment v. Internet Gateway (No. 04-3654).

IEEE-USA's "friend-of-the-court" brief seeks reversal of a September 2004 Federal District Court decision in favor of Blizzard, a computer game company. The Court basically ruled that by opening the shrink wrap of a software package, or clicking on a button during installation, the end user gives up fair use rights, including reverse engineering, granted under Section 107 of the Copyright Act.

Reverse engineering is a common and recognized practice, particularly in computer software, and is extremely important to technological advancement. IEEE-USA defines reverse engineering as the discovery by engineering techniques of the underlying ideas and principles that govern how a machine, computer program or other technological device works.

"Ultimately, the greatest benefits from reverse engineering are reaped by the public at large," IEEE-USA's brief said. "The positive exploitation of ideas expressed in copyrighted works over the past two decades is readily apparent: advanced, competitive computer software industries have fueled the explosive and enlightening development of the Internet as well as many technology-based modern products."

According to IEEE-USA, by exploiting shrink-wrap and click-wrap agreements, software publishers have attempted to use state-based contract law to trump fair-use rights granted under federal law. The organization

believes that such agreements pose a danger to "the nation's intellectual property system" and will chill innovation.

Four U.S. IEEE Members Begin IEEE-USA Government Fellowships

WASHINGTON (24 February 2005) -- Randall Brouwer, Gordon Day, Norman Schneidewind and Nick Zayed began their IEEE-USA Government Fellowships in January. Each is advising government leaders on key technology policy issues and helping them understand the key role engineers play in national security, innovation and economic prosperity.

Brouwer, professor and former chair of the engineering department at Calvin College in Grand Rapids, Mich., is advising Rep. Dana Rohrabacher (R-Calif.). The congressman is a member of the House Science Committee, chaired its Space and Aeronautics Subcommittee for the past eight years, and authored the IEEE-USA-supported Commercial Space Launch Amendments Act that President Bush signed into law on 23 December 2004. (See related story at <http://www.todaysengineer.org/2005/Jan/x-prize.asp>.) Rep. Rohrabacher is also a member of the Congressional Research and Development Caucus, of which IEEE-USA is an advisory committee member.

Day, a retired division chief for the National Institute of Standards and Technology in Boulder, Colo., is advising Sen. Jay Rockefeller (D-W.Va.) on science and technology issues, particularly communications and homeland security. Sen. Rockefeller serves on the Senate Commerce, Science and Transportation Committee, and is ranking member of the Aviation Subcommittee.

Schneidewind is a professor of information sciences at the Naval Postgraduate School in Monterey, Calif. He's supporting Sen. Daniel Akaka (D-Hawaii) and will act as the science adviser to the Senate Homeland Security and Governmental Affairs Committee's Subcommittee on Financial Management, the Budget and International Security.

Zayed is a communications systems engineer with the Northrop Grumman Corp. in Redondo Beach, Calif. He is working in the State Department's Office of Science and Technology Cooperation. The mission of the office is to provide, promote and facilitate policy coordination and international science and technology cooperation among federal technical agencies and their overseas counterparts.

For more information on IEEE-USA's Government Fellowship program, visit <http://www.ieeeusa.org/policy/govfel/index.html>, or contact Erica Wissolik, IEEE-USA program manager, government activities, at e.wissolik@ieee.org.

California Middle School Wins IEEE-USA Future City Competition Award

WASHINGTON (25 February 2005) -- Martin Luther King Jr. Middle School of Oceanside, Calif., won the fifth IEEE-USA Best Communications System Award at the national finals of the National Engineers Week Future City Competition on Wednesday. The honor, one of 31 special awards presented at the Hyatt Regency Crystal City in Arlington, Va., was for the most "efficient and accurate communications system."

Students Karina Coscuna, Alisa Wyman and Peter Vo comprised the team with King teacher sponsor Joanne Norlander and engineer mentor Paul Vo. The team advanced to Washington by winning the Southern California regional competition last month. Its city, Constante Fonte (Portuguese for "Constant Source"), is set in the Amazon rain forest in 2150.

The city's "NET" communications system, which stands for "Nano Ear and Teeth," consists of a nanotechnology-based chip embedded in a person's eardrum and tooth. A wireless voice signal is transmitted to

a communications tower, then to the "head end" at city hall, back to a tower and out to the recipient. The system, as described by the students, can translate any language into the hearer's native tongue.

The award, funded by the IEEE-USA Precollege Education Committee, was judged by IEEE members Lowell Smith of Fairfax, Va., Lee Stogner of Greenville, S.C., and Ananthram Swami of Silver Spring, Md.

"The students' ideas were practical and they had a good grounding in what was possible," Stogner said. "They recognized they had to build on an existing technology to provide a communications infrastructure that people could use in the office and on a personal level."

IEEE Senior Member Michael Andrews, co-regional coordinator of the Phoenix area competition, presented each team member with a plaque. Each student will also receive a \$100 U.S. Savings Bond. King also garnered the Most Innovative Power Generation System Award from the U.S. Navy Nuclear Propulsion Program.

Other IEEE members serving as regional coordinators included Jean Eason (Dallas/Fort Worth); Todd Hiemer (Oklahoma); Osama Mohammed (Florida); and Zafar Taqvi (Houston).

The Future City Competition, which IEEE-USA introduced to Engineers Week in 1993, is designed to encourage the future generation of engineers. Seventh and eighth grade students create their own vision of a city of tomorrow, working first on computer and then constructing three-dimensional scale models. About 30,000 students competed this past year. A longitudinal study of the Future City Competition, funded by the IEEE in 2004, found that half of the respondents who had participated in the competition said they would like to pursue engineering in high school and college.

Louisiana regional champion St. Thomas More School won the overall competition Wednesday. Go to http://www.eweek.org/site/News/Eweek/2005_FC_champions.shtml for more information.

**Announcing the Call For Papers for
IEEE PES Transmission and Distribution Conference & Exposition
October 9 to 14, 2005**

Paper submissions are now invited from authors who would like to present topics of interest in the area of transmission and distribution engineering, operations maintenance and construction at the 2005 IEEE PES Transmission and Distribution Conference & Exposition, October 9 to 14, 2005. The conference offers authors an outstanding opportunity to interact with over 12,000 international and domestic attendees and participate in and observe a 150,000 square foot exposition that will feature the latest in innovations and technology.

The 2005 event will be the largest conference in the world focusing on power delivery and is designed and organized to provide today's power delivery professional with the information and detail necessary to manage technology and business solutions better in the years ahead.

Papers that address any topic pertinent to transmission and distribution will be considered. Key areas are:

- Overhead and Underground Transmission and Distribution Systems
- Safety and Maintenance and Operations
- Distribution Generation
- Power Quality and Grounding
- FACTS and HVDC
- Distribution System Planning and Reliability
- Circuit Breakers
- Cables

Lightning and Insulators
Series and Shunt capacitors
Switching Surges, and Overvoltage Phenomena
Towers, Poles and Conductors
Switchgear and Fuses
Transformers
Protective Relaying

Accepted papers will be published in conference proceedings and will be grouped according to subject matter and presented in two hour long poster sessions. Poster sessions will be held during exhibit hours in an area close to the exhibit hall.

In addition to the poster sessions, conventional panel sessions will also be offered. Panel sessions can be organized through PES Committees and Technical Committee Program Chairs to select timely topics. Panel session organizers must upload all panel session materials to the review web site by April 11, 2005.

Papers must be prepared in accordance with the PES Author's Kit which can be downloaded from the PES web site (www.ieee.org/power - select "paper submissions" from left column of buttons). Specific instructions are given in Part 3, Preparation and Submission of Conference Technical Works." At least one author of the paper must register for the meeting and pay the appropriate fee before an accepted paper will be released for publication or scheduled for the conference. Prepared papers must be submitted via the online submission site. (<http://submissions.miracd.com/td2005/login.asp>).

Additional information can be obtained from Technical Program Chairman, Satish J. Ranade, Klipsch School of Electrical and Computer Engineering, New Mexico State University, Box 30001, MSC 3-0, Las Cruces, NM, 88003, www.sranade@nmsu.edu. The T&D Conference & Exposition web site is <http://www.ieeet-d.org/>.

U.S. Technical Employment Falls by More Than 220,000 Workers from 2000 to 2004

WASHINGTON (3 March 2005) -- The number of employed U.S. technical workers has fallen by 221,000 in six major computer and engineering job classifications from 2000 to 2004, according to data compiled by the U.S. Department of Labor's Bureau of Labor Statistics (BLS).

The largest drops occurred among computer programmers, followed by electrical and electronics engineers, then computer scientists and systems analysts. These declines were offset by substantial employment increases for computer and information systems managers, computer hardware engineers and computer software engineers.

"The drop in computer programmers and rise in managers reflects the trend toward offshoring of programming jobs and the resulting need for professionals to manage outsourced projects," IEEE-USA President Gerard A. Alphonse said.

According to the BLS, computer programmers have taken the biggest hit, with a drop of more than 24 percent -- from 745,000 in 2000 to 564,000 in 2004. In addition, the number of employed electrical and electronics engineers shrunk by 101,000, from 444,000 in 2000 to 343,000 last year, a decrease of nearly 23 percent. Computer scientists and systems analysts have experienced similar losses, dropping more than 16 percent, from 835,000 in 2000 to 700,000 in 2004.

However, employed computer and information systems managers have jumped from 228,000 in 2000 to 337,000 last year, a dramatic increase of almost 48 percent. Computer hardware engineers rose from 83,000 in

2000 to 96,000 in 2004, a nearly 16 percent increase. Employed computer software engineers have risen by 74,000, from 739,000 in 2000 to 813,000 in 2004, a 10 percent increase.

The table below summarizes the BLS data:

<u>Job Classification</u>	<u>2000</u>	<u>2004</u>	<u>Change</u>	<u>Pct.</u>
Computer Hardware Engineers	83,000	96,000	+13,000	+15.7
Computer & Info. Systems Managers	228,000	337,000	+109,000	+47.8
Computer Programmers	745,000	564,000	-181,000	-24.3
Computer Scientists & Systems Analysts	835,000	700,000	-135,000	-16.2
Computer Software Engineers	739,000	813,000	+74,000	+10.0
Electrical & Electronics Engineers	444,000	343,000	-101,000	-22.7
Total:	3,074,000	2,853,000	-221,000	-7.2

NEWS FROM IEEE EDUCATIONAL ACTIVITIES AND THE HISTORY CENTER (2nd Quarter 2005)

CALL FOR 2005 EAB AWARD NOMINATIONS 30 APRIL SUBMISSION DEADLINE APPROACHING

The IEEE Educational Activities Board is accepting nominations of IEEE members for its annual awards. The deadline for nominations is 30 April 2005. Awards include: IEEE EAB Meritorious Achievement Award in Accreditation Activities; IEEE EAB Meritorious Achievement Award in Continuing Education; IEEE EAB Major Educational Innovation Award; IEEE EAB Pre-College Educator Award; IEEE EAB Meritorious Service Citation; IEEE EAB Employer Professional Development Award; And FOR THE FIRST TIME IN 2005 - IEEE EAB Society/Council Professional Development Award (PLEASE NOTE that the EAB Society/Council Professional Development Award is offered in odd-numbered years alternating with the Section Professional Development Award which is offered in even-numbered years).

For award descriptions, honorarium details, and nominations packets, visit <http://www.ieee.org/organizations/eab/EABAwards/callnominations-2005.htm>. For more information, contact: Rae Toscano, Manager, +1 732 562 5482; Karen Kleinschmidt, Administrator, +1 732 562 5493; Email: eab-awards@ieee.org.

HISTORY CENTER MILESTONES

2004 saw seven Milestones dedications, a record! This year seems to be at least on the same pace. Three new Milestones were approved by the IEEE ExCom at their February meeting, four more nominations are being considered by the IEEE History Committee, and several other promising preliminary proposals have been approved. Sections are urged to get involved in local history, particularly through the Milestones Program. More information can be found at http://www.ieee.org/organizations/history_center/milestones_program.html.

HISTORICAL PRESENTATION

IEEE's Regional Activities Department is promoting the use by Sections of IEEE's Net Meeting service to deliver presentations to members who would otherwise have difficulty attending organized meetings at physical locations. To help do this, while at the same time providing content of interest to Sections, History Center Staff Director Dr. Michael Geselowitz delivered a lecture to members of Region 1 entitled "Looking Back to the Future: The History of IEEE" (Region 1 was chosen for this pilot presentation for time-zone reasons). Contact RAD's Denise Maestri at d.maestri@ieee.org for more information on this program.

THE IEEE VIRTUAL MUSEUM

The IEEE Virtual Museum (<http://www.ieee.org/museum>) is IEEE's award-winning outreach site for pre-college youth and the general public that uniquely combines engineering principles with the history and social context of technology. The IEEE Palm Beach Section has been adapting selections from the IEEE Virtual Museum as games in its eBulletin to entertain its members and to give the members tools to promote IEEE to the broader community. The eBulletin can be accessed from <http://ewh.ieee.org/r3/palmbeach/>.

VISIT THE FOLLOWING WEB PAGES FOR THE LATEST NEWS FROM IEEE EDUCATIONAL ACTIVITIES AND THE IEEE HISTORY CENTER:

IEEE EAB Newswire, <http://www.ieee.org/education/newswire>

IEEE History Center What's News, http://www.ieee.org/organizations/history_center/whats_news.html

Offshoring Is Major Cause of Technical Unemployment, IEEE-USA Survey Reveals

WASHINGTON (8 March 2005) -- Offshoring is the second-highest cause of unemployment among U.S. technical professionals, according to the 2004 IEEE-USA Unemployment Survey released today.

The leading cause of unemployment, cited by 62 percent of U.S. IEEE members who reported being laid off, was a business downturn. Fifteen percent reported that their jobs were transferred offshore, while 10 percent pegged merger or acquisition as the cause of their layoff.

A correlation between results of the Unemployment Survey and the 2004 IEEE-USA Salary & Fringe Benefit Survey, which showed the first median income decline for U.S. IEEE members in 31 years, revealed that people in industries reporting the largest drop in income also reported the highest percentage of unemployment because of offshoring. The following chart illustrates this:

Industry	% Drop in Income	% Offshoring
Displacement		
Electrical/Electronic	2.5	16.2
Manufacturing		
Computers	2.4	17.4
Communications	1.8	15.2

"This data supports our contention that offshoring not only contributes significantly to U.S. high-tech unemployment, but also suppresses wages," IEEE-USA President Gerard Alphonse said. "Our concerns extend beyond job loss and depressed incomes to threats to our nation's innovation infrastructure. Because innovation tends to follow jobs, key drivers of our economic prosperity could be lost."

The 2004 Unemployment Survey was sent to 5,329 U.S. IEEE members who reported being laid off at some point in the 2003-04 membership year. This represents an 80.3 percent increase in members reporting unemployment over the 2002 survey. Dr. Laura Langbein, a professor of public affairs at The American University in Washington, D.C., analyzed and reported the results, which are posted at <http://www.ieeeusa.org/careers/pdf/EmploymentSurvey2004Report.pdf>.

Other findings reveal that 37 percent of the 988 respondents said they considered leaving engineering entirely, and 41 percent said they would not recommend the profession to their children.

"Another trend is that employers are providing much less service for laid-off workers than they did before," Langbein wrote. "Severance was provided in only 54 percent of the cases (compared with 90 percent in 2002) and extended benefits in only 27 percent of the cases (compared with 48 percent in 2002)."

The IEEE Cincinnati Section Executive Committee

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